

Progress, Challenges And Perspectives In Flexible Perovskite Solar Cells

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ABSTRACT

Perovskite solar cells have attracted enormous interest since their discovery only a few years ago because they are able to combine the benefits of high efficiency and remarkable ease of processing over large areas. Whereas most of research has been carried out on glass, perovskite deposition and synthesis is carried out at low temperatures (<150 °C) to convert precursors into its final semiconducting form. Thus, developing the technology on flexible substrates can be considered a suitable and exciting arena both from the manufacturing view point (*e.g.* web processing, low embodied energy manufacturing) and that of the applications (*e.g.* flexible, lightweight, portable, easy to integrate over both small, large and curved surfaces). Research has been accelerating on flexible PSCs and has achieved notable milestones including PCEs of 15.6% on laboratory cells, the first modules being manufactured, ultralight cells with record power per gram ratios, and even cells made on fibres. Reviewing the literature, it becomes apparent that more work can be carried out in closing the efficiency gap with glass based counterparts especially at the large-area module level and, in particular, investigating and improving the lifetime of these devices which are built on inherently permeable plastic films. Here we review and provide a perspective on the issues pertaining progress in materials, processes, devices, industrialization and costs of flexible perovskite solar cells.

KEYWORDS: Perovskite solar cells

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